

**ABSTRACT:**

An non-contact type electronic anti-counterfeit identification label is characterized by the coil circuit 3 or the partial circuit 3-1 thereof is formed by printing conductive ink comprising carbon paste and silver paste on the substrate 1 with base material of frangible paper, both ends of the coil circuit 3-1 on the substrate 1 of frangible paper are connected to the IC storage circuit 2 having a specific encryption algorithm and specific password stored thereon. With respect of this type of anti-counterfeit identification label, the substrate of frangible paper may be prevent from repeatedly reusing; the coil formed by printing conductive ink comprising carbon paste and silver paste is damaged as soon as the paper-based base material is damaged, the integrated circuit is damaged as soon as the coil is damaged, so that the integrated circuit on the anti-counterfeit target may only be used once with good security and confidentiality and low cost, and be simple to install, and thus be promising.

**WHAT IS CLAIMED IS:**

1. non-contact type electronic anti-counterfeit identification label according to the present invention, wherein on the label there is printed a coil circuit (3) of an integrated circuit (2) comprising a specific algorithm, characterized by that the coil circuit (3) or a portion of a circuit thereof is formed by printing conductive ink comprising carbon paste and silver paste on a substrate (1) with a base material of frangible paper, both ends of the coil circuit (3) on the substrate (1) of frangible paper are directly connected, in a binding manner, to an integrated circuit (2) having a specific encryption algorithm and specific data and password thereon, sealing them into one package by using encapsulating compound, and super sticker is applied on one side of the integrated circuit 2 and coil circuit (3) on the substrate (1).

2. The non-contact type electronic anti-counterfeit identification label according to claim 1, characterized by the coil circuit (3) comprising the integrated circuit (2) is printed and sealed on the substrate (1) with base material of frangible paper.

3. The non-contact type electronic anti-counterfeit identification label according to claim 1, characterized by including the partial coil circuit (3-1) comprising the integrated circuit (2) and being printed and sealed on the substrate (1) with base material of frangible paper and another coil circuit (3-2) connected with the partial coil circuit (3-1) to form the whole coil circuit 3.

**DETAILED DESCRIPTION:**

Non-contact type electronic anti-counterfeit identification label

5           The present invention is a kind of anti-counterfeit article, and relates to a non-contact type electronic anti-counterfeit identification label that uses a paper-based substrate, on which a circuit that is formed of the ink comprising a mixture of carbon paste and silver paste and acts as a non-contact type antenna is printed, wherein at the terminals of the  
10           antenna there is an integrated circuit (IC) that is connected by conductive adhesive or welding and having a conventional algorithm and an associated password stored thereon.

          A product brand results from the operation of an enterprise over the years and the improvement of the production process, strict quality control  
15           and long term market promotion. Motivated with pursuit of profit, swindlers manufacture counterfeit and shoddy products at a cost that is much less than a normal production operating cost of an enterprise, obtaining huge profits by taking the false article for genuine ones via the outside package, taking substandard products as fine products and illegally  
20           robbing results from operation of an enterprise. With the flooding of counterfeit and shoddy products, market shares of normal goods are greatly reduced, adversely affecting the normal operation of enterprises, and the inferior qualities of counter and shoddy products are also adversely affecting the quality prestige of normal products. The flooding  
25           of counterfeit and shoddy products cause great losses to enterprises and consumers. In order to guarantee the economic development and maintain the legitimate rights and interests for operators, a variety of efforts are made to prevent the flooding of counterfeit and shoddy products.

          1. Use physical means to increase the manufacture difficulty degree  
30           with respect to the structure and mechanical construction, for example,

additionally putting an three anti-cap onto an winebottle, pasting a hologram trademark, printing a fluorescent image and using an ultraviolet ray identification, etc. This increases the counterfeiting difficulty degree and the imitation cost. However, it also increases production costs of normal products, and the increase is the same for both counterfeit & shoddy and normal products. It can only increase the product prices or decrease the product profits, and the swindlers may also profit therefrom. Therefore, radically, some of the currently used physical anti-counterfeiting measures may not result in a good anti-counterfeiting effect, and may be a waste of money in some cases.

2. A reliable anti-counterfeiting approach is to use a chemical method, e.g., applying a liquid medicine with a specific chemical formula onto the package seal of an article, for recognition based on the color rendered when a recognition element is used; however, any improper operation might pollute the article itself or the environment; if the principle is too simple, swindlers may easily imitate successfully by some chemical analysis approaches; and the application of the chemical anti-counterfeiting to the recognition of an article may often damage the original packaging effect.

An object of the present invention is to provide a non-contact type electronic anti-counterfeit identification label that is simple in structure and low cost with a good anti-counterfeit effect.

The non-contact type electronic anti-counterfeit identification label according to the present invention follows traditional electronic anti-counterfeit technologies, and uses a specially designed semi-conductor integrated circuit as a core hardware, and in the integrated circuit, a software means is used to encrypt its internal information in order not to be broken and copies; the inventive technical essential is in that a circuit is formed by printing conductive ink composed of carbon paste and silver paste on a substrate with a base material of frangible paper,

wherein both ends of the circuit are connected to an integrated circuit having a specific encryption algorithm and specific data and password stored thereon, so that a coil circuit is formed as a non-contact type antenna, thereby, the non-contact type electronic identification label according to the present invention will be not only provided with the unbreakable, non-replicative, non-reusable characteristics and good security and confidentiality, but also be convenient to install and low cost.

a non-contact type electronic anti-counterfeit identification label according to the present invention is provided, on the label there is printed a coil circuit of an integrated circuit comprising a specific algorithm, characterized by that the coil circuit or a portion of a circuit thereof is formed by printing conductive ink comprising carbon paste and silver paste on a substrate with a base material of frangible paper, both ends of the coil circuit on the substrate of frangible paper are directly connected, in a binding manner, to an integrated circuit having a specific encryption algorithm and specific data and password stored thereon, sealing them into one package by using encapsulating compound, and super sticker is applied on one side of the integrated circuit and coil circuit on the substrate.

During actual manufacturing, when the frequency of wireless communications is 13.56 MHz, the inductance of the coil is required to be about 75  $\mu$  H, it is simply required to be wound 4 to 5 turns and is shorter, the above-mentioned coil circuit comprising the integrated circuit may be printed and encapsulated on the substrate with base material of frangible paper to form the non-contact type electronic anti-counterfeit identification label of the present invention; whereas when the frequency of wireless communications is 125 kHz, the inductance of the coil ranges from 2 mH to 80 mH, it is required to be wound 400 to 800 turns and is long, at this time, the non-contact type electronic anti-counterfeit identification label of the present invention may also encapsulate the

partial coil circuit and the integrated circuit connected between both ends of this portion of the coil circuit on the substrate with base material of frangible paper, and another part of the coil circuit outside the substrate may form the whole coil circuit in connection with the above-mentioned  
5 coil circuit.

The integrated circuit of the present invention may be designed and fabricated by using existing traditional method based on the actual need for anti-counterfeiting. The design and production of a specialized integrated circuit is a very complicated technology with high requirement  
10 and high investment for design, and the investment for producing the integrated circuit is much higher. On the other hand, the cost for imitating an integrated circuit is several times greater than that for specifically designing a circuit suitable for one's own need, since an imitator will analyze original circuit to imitate the same function in addition to  
15 designing the circuit; even so, it is difficult to make the finished product being fully compatible, thus it is an insurmountable obstacle for swindlers. The information encryption technology is used in the integrated circuit, setting a password will nearly not increase any manufacturing cost, however, the effort for breaking the encryption is huge, greatly increasing  
20 the cost of imitation and so almost making imitation impossible, thereby totally solving the anti-counterfeiting of products in terms of motivation and possibility.

With respect of the non-contact type electronic anti-counterfeit identification label of the present invention, the integrated circuit will  
25 wirelessly communicate with the anti-counterfeit recognizer or similar read/write terminal through the antenna, and check related data and password by means of conventional algorithm to determine the authenticity of the integrated circuit. Furthermore, the paper-based material of the label together with relevant circuit are pasted onto a  
30 specified location by means of super glue, the location will change when

The non-contact type electronic anti-counterfeit identification label of the present invention will be further described below in connection with accompanying figures, wherein:

Fig. 1 is a schematic structural diagram of one embodiment of a non-contact type electronic anti-counterfeit identification label according

to the present invention.

Fig. 2 is a schematic structural diagram of one embodiment of a non-contact type electronic anti-counterfeit identification label according to the present invention.

Fig. 3 is a schematic diagram of the use of a non-contact type electronic anti-counterfeit identification label according to the embodiment of Fig. 2.

As shown in Fig. 1, the non-contact type electronic anti-counterfeit identification label of the present invention is to print a coil circuit 3 on the substrate 1 with base material of frangible paper by using conductive ink comprising carbon paste and silver paste, both ends of the circuit are directly connected to the integrated circuit 2 having specific encryption algorithm and specific data and password stored thereon in a binding manner, which are encapsulated into a package by means of encapsulating compound, and super sticker is applied onto one side of the integrated circuit 2 and coil 3 on the above-mentioned substrate 1. In use, the non-contact type electronic anti-counterfeit label of the present invention is simply pasted on the target with the aid of super sticker.

As shown in Fig. 2, the non-contact type electronic anti-counterfeit identification label of the present invention includes a coil circuit 3-1 comprising an integrated circuit 2 and being printed and sealed, with aid of encapsulating compound, on a substrate 1 with base material of frangible paper, by using conductive ink comprising carbon paste and silver paste, and includes another coil circuit 3-2 connected with the above-mentioned coil circuit 3-1 through flexible PCB 5 and capacitor 4, to form the whole coil circuit 3.

As shown in Fig. 3, the coil circuit 3-2 as shown in Fig. 2 above is pasted on the label paper 6 with sticker, and the coil circuit 3-1 connected with the above-mentioned coil circuit 3-2 through the flexible PCB 5 and capacitor 4 to form the whole coil circuit 3 will not be stuck to the label



paper 6 with sticker, and then super sticker will be applied on the coil circuit 3-2, the coil circuit 3-1 and the label paper 6 with sticker, and a protective glazed paper will cover the surface with super sticker. In use, revealing the glazed paper, the non-contact type electronic anti-counterfeit label of the present invention is pasted on the target with the aid of super sticker.

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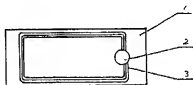
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[54] 发明名称 非接触式电子防伪识别标签

[57] 摘要

一种非接触式电子防伪识别标签,其特征在于线圈回路 3 或其中的一部分电路 3-1 是由碳浆及银浆构成的导电油墨在易碎纸为基材的基板 1 上印刷而成,在上述易碎纸基板 1 上的线圈电路 3-1 的两端联接一具有特定的加密算法并 存有特定密码的 IC 集成电路 2。这种防伪识别标签,易碎纸基板可以避免重复使用;由碳、银导电浆印刷形成的线圈,在纸质基材损毁时一同损毁,线圈 损毁时集成电路一同损毁,使防伪标的上的集成电路只能一次性使用,安全、保密性好,而且安装十分方便,成本也低,其应用前景十分广阔。



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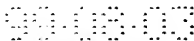
## 权 利 要 求 书

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1. 一种非接触式电子防伪识别标签，在标签上印制有包含有特定算法的IC集成电路(2)的线圈回路(3)，其特征在于所述的线圈回路(3)或其中的一部分电路是由碳浆及银浆构成的导电油墨在易碎纸为基材的基板(1)上印刷而成，在上述易碎纸基板(1)上的线圈电路(3)的两端直接邦定联接一具有特定的加密算法并存有特定的数据及密码的IC集成电路(2)，并用包封胶密封成为一体，上述基板(1)上的IC集成电路2和线圈电路(3)一面铺有强力不干胶。

2. 如权利要求1所述的非接触式电子防伪标签，其特征在于上述包含有IC集成电路(2)的线圈回路(3)均印刷胶封在易碎纸为基材的基板(1)上。

3. 如权利要求1所述的非接触式电子防伪标签，其特征在于包括印刷胶封在易碎纸为基材的基板(1)上的含有IC集成电路(2)的部分线圈电路(3-1)以及与上述部分线圈电路(3-1)连接构成整个线圈回路3的另一线圈(3-2)。



## 说明书

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### 非接触式电子防伪识别标签

本发明属于一种防伪用品，具体涉及一种非接触式电子防伪识别标签，该标签为纸质基体，其上印刷有由碳浆、银浆混合物油墨形成的电路作为非接触式天线，天线引出端为由导电胶或焊接联接的、存有约定算法及相关密码的集成电路(IC)。

商品品牌是企业长年累月经营的成果，来源于企业生产工艺上的改进、严格的质量控制和长期不断的市场推介上的努力。制假者受利益的驱使，以大大低于企业正常生产经营成本生产假冒伪劣产品，通过外在包装等以假乱真手段，以伪充正，以次充好，非法侵占企业的经营成果，获取暴利。假冒伪劣的泛滥，大幅度侵占正常商品的市场占有率，严重影响企业正常的经营，假冒品的低劣的品质还严重影响了正常商品的品质信誉。假冒伪劣商品的泛滥，给消费者及生产企业造成了极大的损失。为了保证商品经济的发展，维护经营者的正当权益，人们作了种种努力防止假冒伪劣的泛滥。

1. 采用物理手段从结构及机械构造上增加制造难度，如在酒瓶上加装三防瓶盖、加贴全息商标、加印荧光图象并用紫外线识别等。这在一定程度上增加了制假的难度，增加了仿制成本。但同时也增加了正常商品的生产成本，而且这种增加程度几乎是相同的，它只能提高商品售价或降低商品的利润，制伪造假者仍能从中获利。因此，从根本上说，目前的一些物理防伪措施，防伪效果并不好，有时反而是一种浪费。

2. 采用化学方法，比如在某一商品的包装封口处，涂一种特定化学配方的药水，用识别剂识别时所显示的颜色鉴定，不失为一种可靠的防伪方式，但如操作不当容易给商品本身造成污染或对环境造成污染；如原理过于简单，仿冒者通过一些化学分析手段也可轻而易举仿制成功；而且运用化学防伪在识别商品的过程中，往往会破坏商品原有的包装效果。

本发明的目的在于提供一种结构简单、成本低、防伪效果好的非接触式电子防伪识别标签。

本发明的非接触式电子防伪识别标签，沿用了传统的电子防伪技术，以专门设计的半导体集成电路为核心硬件，并在集成电路中采用软件手段对其内部信息加密，使其不可破解和复制；其发明的技术要点在于采用由碳浆及银浆构成的导电油墨在一易碎纸为基材的基板上印刷形成的一电路，在该电路的两端联接一具有特定加密算法并存有特定的数据及密码的 IC 集成电路形成一作为非接触式天线的线圈回路，从而使本发明的非接触式电子防伪识别标签，不仅具有传统电子防伪的不可破解和复制性，同时具有不可重复使用的特点，安全、保密性好，而且安装方便，成本也低。

本发明的非接触式电子防伪识别标签，在标签上印制有包含有特定算法的 IC 集成电路的线圈回路，其特征在于所述的线圈回路或其中的一部分电路是由碳浆及银浆构成的导电油墨在一易碎纸为基材的基板上印刷而成，在上述易碎纸基板上的线圈电路的两端直接邦定联接一具有特定的加密算法并存有特定的数据及密码的 IC 集成电路，并用包封胶密封成为一体，上述基板上的 IC 集成电路和线圈电路一面铺有强力不干胶。

在实际制作时，当无线通信频率为 13.56MHz 时，要求线圈的电感量约  $75\mu\text{H}$ ，需绕制 4~5 匝即可，较短，可以将上述包含有 IC 集成电路的整个线圈回路均印刷胶封在易碎纸为基材的基板上而构成本发明的非接触式电子防伪识别标签；而当无线通信频率为 125KHz 时，线圈的电感量在  $2\text{mH} \sim 80\text{mH}$ ，需绕制 400~800 匝，很长，此时，本发明的非接触式电子防伪识别标签也可以将部分线圈电路及联接在该部分线圈电路两端的 IC 集成电路印刷胶封在易碎纸为基材的基板上，而在基板外的构成线圈回路的另一部分线圈电路则可与上述线圈电路构成整个线圈回路。

本发明的集成电路，可以根据防伪的实际需要，采用现有传统的方法设计和制作。设计并生产一个专门的集成电路是一件非常复杂的技术，技术水平要求很高，设计的投入也很大，而生产该集成电路的投入就更大，

而仿制集成电路比真正按自己的意图专门设计一个电路其成本要大几倍，因为仿制者除设计电路外还要剖析原电路以便功能完全相同，即使如此制成品仍然很难做到完全兼容，因此这是制伪造假者的一个极难逾越的障碍。在集成电路中采用信息加密技术，设置一个密码，几乎不增加制造成本，但破译加密投入非常巨大，极大地增加了仿制的成本，使仿制几乎成为不可能，从动机和可能性上完全解决了商品的防伪问题。

本发明的这种非接触式电子防伪识别标签，集成电路通过天线以无线通信的方式与防伪识别器或类似的读写终端进行通信，并通过约定的算法核对相关数据及密码，从而确定集成电路的真伪，而该标签的纸基材料连同有关电路是通过强力胶水粘贴到有关商品的特定位置，该位置在消费商品或启用商品时将产生变化，从而对标签进行破坏；而纸质标签非常易损，如果试图从商品中分离出该标签亦将造成该标签损毁、破坏，进而形成一商品一标签，通过识别标签真伪即可达到鉴别商品真伪的目的，该标签还可代替条码作为物品识别标签。

本发明的非接触式电子防伪识别标签，基材采用易破坏的纸质作为基板，可以避免重复使用，而且价廉；由碳、银浆混合物导电浆印刷在易碎纸上而形成的线圈，在纸质基材损毁时一同损坏，线圈两端与集成电路直接中间并无焊点，并用黑胶密封成一体，即线圈损毁同时集成电路一同损毁，使得安装于防伪标上的集成电路只能一次性用于所要保护的商品，安全、保密性好，而且安装十分方便，成本也低。并且因为线圈采用丝网印刷工艺制成，成本非常低廉；本发明的运用及推广，以低廉的成本，十分有效地防止了假冒品的出现，无疑将会产生巨大的经济效益及社会效益，同时本发明还可以作为物品的识别标签在物流控制方面得以广泛运用，其应用前景十分广阔。

以下结合附图对本发明的非接触式电子防伪识别标签作进一步说明：

图1是本发明非接触式电子防伪识别标签的一种实施例的结构示意图。

图2是本发明非接触式电子防伪识别标签的一种实施例的结构示意图。

图3是图2实施例的非接触式电子防伪识别标签的使用示意图。

如图1所示，本发明的非接触式电子防伪识别标签，是在以易碎纸为基材的基板1上，用碳浆及银浆构成的导电油墨印刷一线圈回路3，在该回路的两端直接邦定联接一具有特定的加密算法并存有特定的数据及密码的IC集成电路2，并用封装胶密封成为一体，在上述基板1上的IC集成电路2和线圈电路3一面铺有强力不干胶。使用时，借助于强力不干胶将本发明的这种非接触式电子防伪标签粘贴在目标物上即可。

如图2所示，本发明的非接触式电子防伪识别标签，包括用碳浆及银浆构成的导电油墨印刷胶封在易碎纸为基材的基板1上的含有IC集成电路2的线圈电路3-1以及通过软性PCB板5及电容4与上述线圈电路3-1联接构成整个线圈回路3的另一线圈电路3-2。

如图3所示，将上述图2所示的线圈电路3-2粘贴在不干胶标签纸6上，而通过软性PCB板5及电容4与上述线圈电路3-2相联而构成整个线圈回路3的线圈电路3-1则与不干胶标签纸6不相粘结，然后在该线圈电路3-2、线圈电路3-1以及不干胶标签纸6上都涂有强力不干胶，再在胶面上复盖一张保护用蜡光纸。使用时，揭开保护用蜡光纸，借助于强力不干胶将本发明的这种非接触式电子防伪标签粘贴在目标物上。

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说明书附图

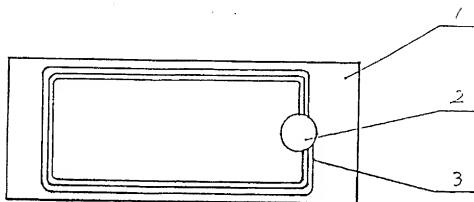


图 1

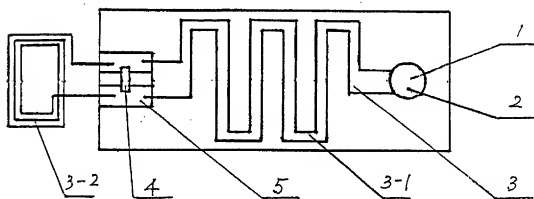


图 2

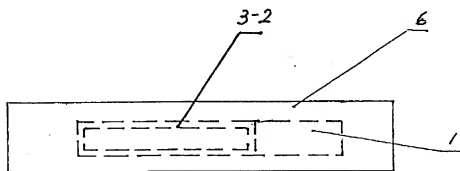


图 3